
Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866) 217-9197 (toll free).

Reviewer: Keisha Douglas

Timestamp: [year=2008; month=10; day=31; hr=15; min=7; sec=50; ms=811;]

Validated By CRFValidator v 1.0.3

Application No: 10590275 Version No: 1.0

Input Set:

Output Set:

Started: 2008-10-06 16:27:05.242

Finished: 2008-10-06 16:27:08.003

Elapsed: 0 hr(s) 0 min(s) 2 sec(s) 761 ms

Total Warnings: 25

Total Errors: 0

No. of SeqIDs Defined: 28

Actual SeqID Count: 28

Err	or code	Error Description
W	402	Undefined organism found in <213> in SEQ ID (4)
W	402	Undefined organism found in <213> in SEQ ID (5)
W	402	Undefined organism found in <213> in SEQ ID (6)
W	402	Undefined organism found in <213> in SEQ ID (7)
W	213	Artificial or Unknown found in <213> in SEQ ID (8)
W	213	Artificial or Unknown found in <213> in SEQ ID (9)
W	213	Artificial or Unknown found in <213> in SEQ ID (10)
W	213	Artificial or Unknown found in <213> in SEQ ID (11)
W	213	Artificial or Unknown found in <213> in SEQ ID (12)
W	213	Artificial or Unknown found in <213> in SEQ ID (13)
W	213	Artificial or Unknown found in <213> in SEQ ID (14)
W	213	Artificial or Unknown found in <213> in SEQ ID (15)
W	213	Artificial or Unknown found in <213> in SEQ ID (16)
W	213	Artificial or Unknown found in <213> in SEQ ID (17)
W	402	Undefined organism found in <213> in SEQ ID (18)
W	402	Undefined organism found in <213> in SEQ ID (19)
W	402	Undefined organism found in <213> in SEQ ID (20)
W	402	Undefined organism found in <213> in SEQ ID (21)
W	213	Artificial or Unknown found in <213> in SEQ ID (22)
W	213	Artificial or Unknown found in <213> in SEQ ID (23)

Input Set:

Output Set:

Started: 2008-10-06 16:27:05.242 **Finished:** 2008-10-06 16:27:08.003

Elapsed: 0 hr(s) 0 min(s) 2 sec(s) 761 ms

Total Warnings: 25

Total Errors: 0

No. of SeqIDs Defined: 28

Actual SeqID Count: 28

Error code		Error Description										
W	213	Artificial or Unknown found in <213> in SEQ ID (24	ł)									
W	213	Artificial or Unknown found in <213> in SEQ ID (25	5)									
W	213	Artificial or Unknown found in <213> in SEQ ID (26	5)									
W	213	Artificial or Unknown found in <213> in SEQ ID (27	⁷)									
W	213	Artificial or Unknown found in <213> in SEQ ID (28	3)									

SEQUENCE LISTING

<110> KAO CORPORATION Keiji Endo Katsuya Ozaki

<120> Mutant Bacterium Belonging to the Genus Bacillus

<130> KS0816

<140> 10590275 <141> 2008-10-06

<150> JP 2004-062852 <151> 2004-03-05

<160> 28

<170> PatentIn Ver. 3.1

<210> 1 <211> 371 <212> PRT

<213> Bacillus subtilis

<400> 1

Met Ala Asp Lys Gln Thr His Glu Thr Glu Leu Thr Phe Asp Gln Val 1 5 10 15

Lys Glu Gln Leu Thr Glu Ser Gly Lys Lys Arg Gly Val Leu Thr Tyr 20 25 30

Glu Glu Ile Ala Glu Arg Met Ser Ser Phe Glu Ile Glu Ser Asp Gln 35 40 45

Met Asp Glu Tyr Tyr Glu Phe Leu Gly Glu Gln Gly Val Glu Leu Ile 50 60

Ser Glu Asn Glu Glu Thr Glu Asp Pro Asn Ile Gln Gln Leu Ala Lys 65 70 75 80

Ala Glu Glu Glu Phe Asp Leu Asn Asp Leu Ser Val Pro Pro Gly Val 85 90 95

Lys Ile Asn Asp Pro Val Arg Met Tyr Leu Lys Glu Ile Gly Arg Val 100 105 110

Asn Leu Leu Ser Ala Lys Glu Glu Ile Ala Tyr Ala Gln Lys Ile Glu 115 120 125

Glu	Gly 130	Asp	Glu	Glu	Ser	Lys 135	Arg	Arg	Leu	Ala	Glu 140	Ala	Asn	Leu	Arg
Leu 145	Val	Val	Ser	Ile	Ala 150	Lys	Arg	Tyr	Val	Gly 155	Arg	Gly	Met	Leu	Phe 160
Leu	Asp	Leu	Ile	His 165	Glu	Gly	Asn	Met	Gly 170	Leu	Met	Lys	Ala	Val 175	Glu
Lys	Phe	Asp	Tyr 180	Arg	Lys	Gly	Tyr	Lys 185	Phe	Ser	Thr	Tyr	Ala 190	Thr	Trp
Trp	Ile	Arg 195	Gln	Ala	Ile	Thr	Arg 200	Ala	Ile	Ala	Asp	Gln 205	Ala	Arg	Thr
Ile	Arg 210	Ile	Pro	Val	His	Met 215	Val	Glu	Thr	Ile	Asn 220	Lys	Leu	Ile	Arg
Val 225	Gln	Arg	Gln	Leu	Leu 230	Gln	Asp	Leu	Gly	Arg 235	Glu	Pro	Thr	Pro	Glu 240
Glu	Ile	Ala	Glu	Asp 245	Met	Asp	Leu	Thr	Pro 250	Glu	Lys	Val	Arg	Glu 255	Ile
Leu	Lys	Ile	Ala 260	Gln	Glu	Pro	Val	Ser 265	Leu	Glu	Thr	Pro	Ile 270	Gly	Glu
Glu	Asp	Asp 275	Ser	His	Leu	Gly	Asp 280	Phe	Ile	Glu	Asp	Gln 285	Glu	Ala	Thr
Ser	Pro 290	Ser	Asp	His	Ala	Ala 295	Tyr	Glu	Leu	Leu	Lys 300	Glu	Gln	Leu	Glu
Asp 305	Val	Leu	Asp	Thr	Leu 310	Thr	Asp	Arg	Glu	Glu 315	Asn	Val	Leu	Arg	Leu 320
Arg	Phe	Gly	Leu	Asp 325	Asp	Gly	Arg	Thr	Arg 330	Thr	Leu	Glu	Glu	Val 335	Gly
Lys	Val	Phe	Gly	Val	Thr	Arg	Glu	Arg	Ile	Arg	Gln	Ile	Glu 350	Ala	Lys

Ala Leu Arg Lys Leu Arg His Pro Ser Arg Ser Lys Arg Leu Lys Asp 355 360 365

Phe Leu Glu 370

<210> 2

<211> 1047

<212> DNA

<213> Bacillus subtilis

<400> 2

<400 <i>></i>	۷ +++ a	ttaataatta	tagaagaagt	tassasaaat	gataatgttg	attagattat	60
acagee		ttcctcattc	cygacyaycc	tgaagaccct	cataatettg	getecateat	00
gaggac	agca	gatgcggtcg	gcgctcatgg	catcgtcatt	ccaaaacgga	gagctgtcgg	120
gctgac	aaca	acagtggcaa	aagcttcaac	aggagcaatt	gagcacattc	ctgtagcaag	180
agtcac	caat	ttggcacgga	cgttagaaga	gatgaaagag	cggggaatct	gggttgtcgg	240
aacgga	tgcg	tccgcgcgtg	aggatttccg	taatatggac	ggcaatatgc	ctttggctct	300
agtcat	cgga	agtgaaggaa	aagggatggg	ccgccttgtg	aaggaaaagt	gcgattttct	360
cattaa	actc.	ccgatggccg	gaaaggtaac	ttcactaaat	gcatctgtcg	cggctggtct	420
tttgat	gtat	gaagtctacc	ggaaacgaaa	ccctgtggga	gaataaagac	ccatggatat	480
cctgtt	agta	gacgggtaca	acatgattgg	agcctggccg	cagctgaagg	atttaaaagc	540
gaacag	tttt	gaagaggcga	gagacgtact	gattcagaaa	atggcggaat	atcaatcgta	600
tacagg	aaac	agggttattg	ttgtttttga	cgcgcatctc	gtaaaagggc	ttgagaaaaa	660
acagac	caac	catagagttg	aagtaatttt	tacaaaagaa	aatgagacgg	ctgatgagcg	720
gataga	.aaag	ctcgctcagg	ctttgaataa	tattgcgact	caaattcacg	ttgcgacctc	780
tgacta	tact.	gagcagtggg	cgattttcgg	acagggggca	ttgcggaaat	cggcccggga	840
gcttct	gaga	gaggtagaaa	cgattgaaag	gcgaatagag	agacgggtaa	gaaaaatcac	900
ttccga	.aaag	ccggcgggta	aaattgcttt	atcggaagag	gttttgaaaa	cgtttgaaaa	960
gtggag	gcgg	ggagacttag	attaagttga	cgcttttttg	cccaatactg	tataatattt	1020
ctatct	acgt	gcgccggggg	gatcgga				1047

<210> 3

<211> 1143

<212> DNA

<213> Bacillus subtilis

<400> 3 gctgatagaa cgtgacacgg gaaaagtgct ttacaacaag aacagcaatg agagactggc 60 gcctgcaagc atgacgaaaa ttatgacgat gcttttgatt atggaagctt tagataaagg 120 caaaatcaaa atgagtgata aggtccgtac aagcgagcat gcggcgtcaa tgggcggctc 180 240 acagatattc cttgagcccg gcgaagaaat gactgtcaaa gaaatgctga aaggcatcgc aatcgcttcg ggaaatgacg cttccgtcgc catggctgaa tttatttccg gctctgaaga 300 agaatttgtg aagaaaatga ataaaaaagc aaaagagctg ggattgaaaa atacatcctt 360 taaaaaccca acaggactga ccgaggaagg acactacagc tctgcttatg acatggcaat 420 catggctaag gaattattga aatacgaatc aattacgaag tttaccggca cgtatgaaga 480 540 ttatctgcgt gaaaatacag ataaaaagtt ttggcttgta aatacaaatc gccttatcaa 600 attttatcct ggtgtagacg gcgtaaaaac aggctataca ggcgaagcga aatattgtct 660 gactgcttcg gctaaaaaag gaaacatgcg ggccatagcg gttgtattcg gagcgagcac 720 gcctaaagaa agaaacgcgc aagtgacaaa aatgcttgac ttcgccttta gccaatatga aacgcatcct ttatataaac gaaatcaaac agtagcaaaa gtaaaggtca aaaaagggaa 780 840 acaaaaattt atcgaactca ctacatctga gccgatttca atattgacga aaaaaggcga ggatatgaac gatgtgaaaa aagaaatcaa gatgaaggac aatattagtg ctccgattca 900 aaaaggccaa gagcttggca ctcttgttct gaaaaaggat ggagaagtac tcgctgaaag 960 tcctgttgct gcaaaagaag atatgaagaa agccgggttt atcacattct taaagcggac 1020 gatgggagac tggacaaaat ttaagtaatt atgccgaatg accactagtt ttgtcacggt 1080

<210> 4

agc

<211> 795

<212> PRT

<213> Bacillus sp. KSM-S237

<400> 4

Ala Glu Gly Asn Thr Arg Glu Asp Asn Phe Lys His Leu Leu Gly Asn

1 10 15

gaaggaattc attccgtcga aatcgaaaca ctcattatcc gatcatatca aggaggaatg

1140

1143

Asp Asn Val Lys Arg Pro Ser Glu Ala Gly Ala Leu Gln Leu Gln Glu 20 25 30

Val Asp Gly 35	Gln Met	Thr Leu	Val 40	Asp	Gln	His	Gly	Glu 45	Lys	Ile	Gln
Leu Arg Gly 50	Met Ser	Thr His	Gly	Leu	Gln	Trp	Phe 60	Pro	Glu	Ile	Leu
Asn Asp Asn 65	Ala Tyr	Lys Ala 70	Leu	Ser	Asn	Asp 75	Trp	Asp	Ser	Asn	Met 80
Ile Arg Leu	Ala Met 85	Tyr Val	Gly	Glu	Asn 90	Gly	Tyr	Ala	Thr	Asn 95	Pro
Glu Leu Ile	Lys Gln 100	Arg Val	Ile	Asp 105	Gly	Ile	Glu	Leu	Ala 110	Ile	Glu
Asn Asp Met 115	Tyr Val	Ile Val	Asp 120	Trp	His	Val	His	Ala 125	Pro	Gly	Asp
Pro Arg Asp 130	Pro Val	Tyr Ala 135	_	Ala	Lys	Asp	Phe 140	Phe	Arg	Glu	Ile
Ala Ala Leu 145	Tyr Pro	Asn Asn 150	Pro	His	Ile	Ile 155	Tyr	Glu	Leu	Ala	Asn 160
Glu Pro Ser	Ser Asn 165	Asn Asn	Gly	Gly	Ala 170	Gly	Ile	Pro	Asn	Asn 175	Glu
Glu Gly Trp	Lys Ala 180	Val Lys	Glu	Tyr 185	Ala	Asp	Pro	Ile	Val 190	Glu	Met
Leu Arg Lys 195			200					205			
Pro Asn Trp 210		215					220				
Asp His His 225		230				235					240
Ala Ser Thr	Glu Ser 245	Tyr Pro	Ser	Glu	Thr 250	Pro	Asn	Ser	Glu	Arg 255	Gly

Asn Val Met Ser Asn Thr Arg Tyr Ala Leu Glu Asn Gly Val Ala Val

260 265 270

Phe Ala Thr Glu Trp Gly Thr Ser Gln Ala Ser Gly Asp Gly Gly Pro 275 280 285 Tyr Phe Asp Glu Ala Asp Val Trp Ile Glu Phe Leu Asn Glu Asn Asn 295 300 Ile Ser Trp Ala Asn Trp Ser Leu Thr Asn Lys Asn Glu Val Ser Gly 310 315 320 305 Ala Phe Thr Pro Phe Glu Leu Gly Lys Ser Asn Ala Thr Asn Leu Asp 325 330 Pro Gly Pro Asp His Val Trp Ala Pro Glu Glu Leu Ser Leu Ser Gly 340 345 350 Glu Tyr Val Arg Ala Arg Ile Lys Gly Val Asn Tyr Glu Pro Ile Asp 355 360 Arg Thr Lys Tyr Thr Lys Val Leu Trp Asp Phe Asn Asp Gly Thr Lys 370 375 Gln Gly Phe Gly Val Asn Ser Asp Ser Pro Asn Lys Glu Leu Ile Ala 390 395 400 385 Val Asp Asn Glu Asn Asn Thr Leu Lys Val Ser Gly Leu Asp Val Ser 405 410 415 Asn Asp Val Ser Asp Gly Asn Phe Trp Ala Asn Ala Arg Leu Ser Ala 420 425 430 Asn Gly Trp Gly Lys Ser Val Asp Ile Leu Gly Ala Glu Lys Leu Thr 435 440 Met Asp Val Ile Val Asp Glu Pro Thr Thr Val Ala Ile Ala Ala Ile 450 455 460 Pro Gln Ser Ser Lys Ser Gly Trp Ala Asn Pro Glu Arg Ala Val Arg 475 470 465

Val Asn Ala Glu Asp Phe Val Gln Gln Thr Asp Gly Lys Tyr Lys Ala

490

495

485

Gly L	eu Thr	Ile 500	Thr	Gly	Glu	Asp	Ala 505	Pro	Asn	Leu	Lys	Asn 510	Ile	Ala
Phe H	is Glu 515		Asp	Asn	Asn	Met 520	Asn	Asn	Ile	Ile	Leu 525	Phe	Val	Gly
	sp Ala 30	Ala	Asp	Val	Ile 535	Tyr	Leu	Asp	Asn	Ile 540	Lys	Val	Ile	Gly
Thr G	lu Val	Glu	Ile	Pro 550	Val	Val	His	Asp	Pro 555	Lys	Gly	Glu	Ala	Val 560
Leu P	ro Ser	Val	Phe 565	Glu	Asp	Gly	Thr	Arg 570	Gln	Gly	Trp	Asp	Trp 575	Ala
Gly G	lu Ser	Gly 580	Val	Lys	Thr	Ala	Leu 585	Thr	Ile	Glu	Glu	Ala 590	Asn	Gly
Ser A	sn Ala 595		Ser	Trp	Glu	Phe 600	Gly	Tyr	Pro	Glu	Val 605	Lys	Pro	Ser
_	sn Trp	Ala	Thr	Ala	Pro 615	Arg	Leu	Asp	Phe	Trp 620	Lys	Ser	Asp	Leu
Val A 625	rg Gly	Glu	Asn	Asp 630	Tyr	Val	Ala	Phe	Asp 635	Phe	Tyr	Leu	Asp	Pro 640
Val A	rg Ala	Thr	Glu 645	Gly	Ala	Met	Asn	Ile 650	Asn	Leu	Val	Phe	Gln 655	Pro
Pro T	hr Asn	Gly 660	Tyr	Trp	Val	Gln	Ala 665	Pro	Lys	Thr	Tyr	Thr 670	Ile	Asn
Phe A	sp Glu 675		Glu	Glu	Ala	Asn 680	Gln	Val	Asn	Gly	Leu 685	Tyr	His	Tyr
	al Lys 90	Ile	Asn	Val	Arg 695	Asp	Ile	Thr	Asn	Ile 700	Gln	Asp	Asp	Thr
Leu L	eu Arg	Asn	Met	Met	Ile	Ile	Phe	Ala	Asp	Val	Glu	Ser	Asp	Phe

Ala Gly Arg Val Phe Val Asp Asn Val Arg Phe Glu Gly Ala Ala Thr 725 730 735

Thr Glu Pro Val Glu Pro Glu Pro Val Asp Pro Gly Glu Glu Thr Pro 740 745 750

Pro Val Asp Glu Lys Glu Ala Lys Lys Glu Gln Lys Glu Ala Glu Lys
755 760 765

Glu Glu Lys Glu Ala Val Lys Glu Glu Lys Lys Glu Ala Lys Glu Glu
770 780

Lys Lys Ala Val Lys Asn Glu Ala Lys Lys 785 790 795

<210> 5

<211> 3150

<212> DNA

<213> Bacillus sp. KSM-S237

<220>

<221> CDS

<222> (573)..(3044)

<220>

<221> sig_peptide

<222> (573)..(659)

<220>

<221> mat_peptide

<222> (660)..(3044)

<400> 5

gatttgccga tgcaacaggc ttatatttag aggaaatttc tttttaaatt gaatacggaa 60 taaaatcagg taaacaggtc ctgattttat tttttttgagt tttttagaga actgaagatt 120 gaaataaaag tagaagacaa aggacataag aaaattgcat tagttttaat tatagaaaac 180 gcctttttat aattatttat acctagaacg aaaatactgt ttcgaaagcg gtttactata 240 aaaccttata ttccggctct tttttaaaac agggggtaaa aattcactct agtattctaa 300 360 tttcaacatg ctataataaa tttgtaagac gcaatatgca tctcttttt tacgatatat gtaagcggtt aaccttgtgc tatatgccga tttaggaagg ggggtagatt gagtcaagta 420 gtaataatat agataactta taagttgttg agaagcagga gagcatctgg gttactcaca 480 540 agttttttta aaactttaac gaaagcactt tcggtaatgc ttatgaattt agctatttga

ttcaattact ttaaaaatat ttaggaggta at	atg atg tta aga aag aaa aca 593 Met Met Leu Arg Lys Lys Thr -25
aag cag ttg att tct tcc att ctt att Lys Gln Leu Ile Ser Ser Ile Leu Ile -20 -15	Ţ
ttt ccg gca gct ctt gca gca gaa gga Phe Pro Ala Ala Leu Ala Ala Glu Gly -5 -1 1	
aaa cat tta tta ggt aat gac aat gtt Lys His Leu Leu Gly Asn Asp Asn Val 15	
gca tta caa tta caa gaa gtc gat gga Ala Leu Gln Leu Gln Glu Val Asp Gly 30 35	
cat gga gaa aaa att caa tta cgt gga His Gly Glu Lys Ile Gln Leu Arg Gly 45 50	
tgg ttt cct gag atc ttg aat gat aac Trp Phe Pro Glu Ile Leu Asn Asp Asn 60 65	
gat tgg gat tcc aat atg att cgt ctt Asp Trp Asp Ser Asn Met Ile Arg Leu 75 80	
ggg tac gct aca aac cct gag tta atc Gly Tyr Ala Thr Asn Pro Glu Leu Ile 95	
att gag tta gcg att gaa aat gac atg Ile Glu Leu Ala Ile Glu Asn Asp Met 110 115	
gtt cat gcg cca ggt gat cct aga gat Val His Ala Pro Gly Asp Pro Arg Asp 125 130	
gat ttc ttt aga gaa att gca gct tta Asp Phe Phe Arg Glu Ile Ala Ala Leu 140 145	
att tat gag tta gcg aat gag ccg agt Ile Tyr Glu Leu Ala Asn Glu Pro Ser 155 160	
ggg att ccg aat aac gaa gaa ggt tgg Gly Ile Pro Asn Asn Glu Glu Gly Trp 175	
gat cca att gta gaa atg tta cgt aaa	age ggt aat gca gat gac aac 1265

Asp Pro Ile Val Glu Met Leu Arg Lys Ser Gly Asn Ala Asp Asp Asn 190 $$ 195 $$ 200

att atc att gtt ggt agt cca aac tgg agt cag cgt ccg gac tta gca \$1313\$ Ile Ile Ile V